

preparing a target sample from target cells suspected of having a mutation in said target up-stream regulatory gene, said target cells being otherwise substantially similar to said reference cells;

detecting the expression of a plurality of more than 100 down-stream genes in said reference sample to obtain a reference expression pattern, said down-stream genes being up or down regulated by said wild-type up-stream regulatory gene;

detecting the expression of said plurality of down-stream genes in said target sample to obtain a target expression pattern; and

comparing said reference pattern with said target expression pattern to detect functional mutation in or inactivation of said target gene.

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29. (Twice Amended) A method for detecting a p53 gene functional mutation in target cells comprising the steps of:

preparing a reference sample from reference cells having a wild-type p53 gene, said reference cells being otherwise substantially similar to said target cells;

detecting the expression of a plurality of more than 100 down-stream genes in said reference cells and said target cells to obtain a target expression pattern and a reference expression pattern, said down-stream genes being up- or down-regulated by said wild-type p53 gene; and

comparing said reference expression pattern with said target expression pattern to detect said p53 functional mutation.

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34. (Twice Amended) An in-cell functional assay for a p53 sequence alteration comprising the steps of:

preparing a target sample from target cells having said p53 sequence alteration;

preparing a reference sample from reference cells having a wild-type p53 gene, said reference cells being otherwise substantially similar to said target cells;

detecting the expression of a plurality of more than 100 down-stream genes in said reference cells to obtain a reference expression pattern and in said target cells to obtain a target expression pattern, said down-stream genes being selected from the group consisting of p53 up-regulated genes and p53 down-regulated genes; and